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| 10/635,194 | 08/06/2003 | Youssef Abdelilah | RAL919980074US2<br>4269-61CT | 8322 |

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| EXAMINER | |
|---|---|
| KUMAR, PANKAJ | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2631 | |

DATE MAILED: 03/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/635,194 | ABDELILAH ET AL. | |
| | Examiner | Art Unit | |
| | Pankaj Kumar | 2631 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *20 October 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-3,5-14,16-22 and 24-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) *20-22 and 24-27* is/are allowed.

6)☒ Claim(s) *1,9,11,12,17 and 19* is/are rejected.

7)☒ Claim(s) *2,3,5-8,10,13,14,16 and 18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/6/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

2. There seems to be a typo in the prior action. A rejection was sent but also it said it was a quayle. Since there was a rejection, there was not meant to be a quayle.

### *Response to Amendment*

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 9, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over McDonough USPN 5,778,024 in view of Hodgkiss USPN 4,901,333.

5. As per claim 1, McDonough in view of Hodgkiss teach a receiver for demodulating a data signal transmitted from a digital source at a network sampling rate that is synchronized with a network clock, comprising: a two-stage interpolator, responsive to digital samples of the data signal, that, generates interpolated digital samples (McDonough fig. 5a: interpolators 460, 426 (fig. 5b: 592), 550(fig. 5c: 608); fig. 5a has external connections like in fig. 2 like buffer and modem interface and thus fig. 5a also have the external timing and timing from timing generator) in response thereto, the digital samples having a first local sample rate (inherent for digital samples to be sampled at at least one rate) that is synchronized with a local clock (McDonough

fig. 2: 110) (McDonough does not teach synchronizing with a local clock but it would be obvious as explained below) and the interpolated digital samples having a second local sample rate that is synchronized with the network clock (McDonough fig. 1: external timing) (McDonough does not teach synchronizing with a network clock but it would be obvious as explained below); an adaptive fractionally spaced decision feedback equalizer, responsive to the interpolated digital samples, that generates equalized digital samples at the network sampling rate (this is not in McDonough but it would be obvious as explained below) in synchronization with the network clock; and a slicer, responsive to the equalized digital samples, that generates detected symbols therefrom corresponding to data from the data signal (McDonough fig. 5a: 470, 572).

6. McDonough does not teach an adaptive fractionally spaced decision feedback equalizer, responsive to the interpolated digital samples, that generates equalized digital samples at the network sampling rate. Hodgkiss teaches an adaptive fractionally spaced decision feedback equalizer, responsive to the interpolated digital samples, that generates equalized digital samples at the network sampling rate in the bottom of fig. 1 with the adaptive equalizer that has decision feedback and the adaptive equalizer is responsive to the interpolator as the adaptive equalizer is after the interpolator. It is inherent for an equalizer to have fractionally spaced taps as the taps all cannot be physically located at one place and thus they need to be spaced fractional units apart. Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to arrive at the adaptive fractionally spaced decision feedback equalizer, responsive to the interpolated digital samples, that generates equalized digital samples at the network sampling rate as recited by the instant claims, because the combined teaching of McDonough with

Hodgkiss suggest adaptive fractionally spaced decision feedback equalizer, responsive to the interpolated digital samples, that generates equalized digital samples at the network sampling rate as recited by the instant claims. Furthermore, one of ordinary skill in the art, would have been motivated to combine the teachings of McDonough with Hodgkiss because McDonough suggests equalizer (something broad) in general and Hodgkiss suggests the beneficial use of adaptive equalization such as adapting the system to changing signals in the analogous art of equalization.

~~7.~~ McDonough does not teach synchronization with a local clock and synchronizing with a network clock. The office takes official notice that a system needs to synchronize with clocks and local samples would synchronize with local clocks and external samples would synchronize with the network clock of the network receiving the external samples in order for the system components to know when to sample in order for the system to operate. Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to modify the prior art teaching of McDonough with the synchronization with the local and network clocks as indicated by the instant claims, because McDonough suggests appropriate sampling so that the system can function properly and synchronizing with the appropriate clock will provide such sampling in the analogous art of a receiver.

8. As per claim 9, means for identifying a signaling alphabet used by the slicer (McDonough "code excited linear prediction" – CELP, the output of the decoder is the signaling alphabet that is identified and it goes back into the filters via other components in fig. 5a; deviation limiter 465 is limiting the signaling alphabets that can be input into the filter 470) to generate the detected symbols (McDonough fig. 5a: output of filters 470, 572).

9. As per claim 11, McDonough teaches the method as recited in claim 1 wherein the detected symbols are PCM codewords (McDonough col. 5 last line; col. 6 lines 20, 21, 24; etc.).

10. Claims 12, 17, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over McDonough USPN 5,778,024.

11. As per claim 12, a method for demodulating, in a receiver, a data signal transmitted from a digital source at a network sampling rate that is synchronized with a network clock comprising the steps of: sampling the data signal to produce digital samples at a first local sample rate that is synchronized with a local clock (McDonough fig. 2: 110); interpolating the digital samples to produce (McDonough fig. 5C: 608 is interpolating and fig. 5C is element 550 which is shown in fig. 5A which is shown in fig. 5A to be after fig. 6's element 490; digital samples as samples are the samplings of a signal based on a clock) first and second estimates for each of the digital samples (this is not in McDonough but it would be obvious as explained below); interpolating, using a linear interpolator, (McDonough fig. 5A: 406 is converting to linear and interpolation such as in 460 is occurring after linear conversion, 406, 416; fig. 5A, 5B: 426, 592) the first and second estimates (McDonough fig. 5A: two serial outputs of 550) to produce interpolated digital samples having a second local sample rate (McDonough fig. 5C which is part of fig. 5A has 3x interpolation while 460 in fig. 5A has 2:5 interpolation) that is synchronized with the network clock (McDonough fig. 1: external timing); equalizing (McDonough fig. 4: 338, 348) the interpolated digital samples to produce equalized digital samples (McDonough fig. 4); and decoding the equalized digital samples to generate detected symbols therefrom (McDonough fig. 4: 346, 350, fig 5C: 292, fig. 5A, fig. 6).

12. McDonough does not teach first and second estimates for each of the digital samples. The office takes official notice that when at two different times there are two outputs, these are also first and second estimates. If this is not sufficient then when inphase (I) and quadrature (Q) samples exist and they are interpolated, that first and second estimates of the digital sample are the estimates of the I and Q samples. Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to modify the prior art teaching of McDonough with first and second estimates for each of the digital samples as recited by the instant claims, because McDonough suggests that the system operates over time and thus will generate many samples in the analogous art of digital sample estimates. If this is not sufficient McDonough teaches digital modulation/demodulation and quadrature amplitude modulation/demodulation is a form of digital modulation/demodulation which would require I and Q samples in the analogous art of modulation/demodulation.

13. As per claim 17, McDonough teaches the method as recited in claim 12 further comprising identifying a signaling alphabet used by the slicer (McDonough "code excited linear prediction" – CELP, the output of the decoder is the signaling alphabet that is identified and it goes back into the filters via other components in fig. 5a; deviation limiter 465 is limiting the signaling alphabets that can be input into the filter 470) to generate the detected symbols (McDonough fig. 5a: output of filters 470, 572).

14. As per claim 19, McDonough teaches the method as recited in claim 12 wherein the detected symbols are PCM codewords (McDonough col. 5 last line; col. 6 lines 20, 21, 24; etc.).

***Allowable Subject Matter***

15. Claims 2, 3, 5-8, 10, 13, 14, 16, 18 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

16. Claims 20-22, 24-27 are allowed.

17. The following is a statement of reasons for the indication of allowable subject matter for claims 20-22, 24-27: The art of record does not suggest the respective claim combinations together and nor would the respective claim combinations be obvious with: third logic configured to use a polyphase interpolator to produce the first and second estimates, fourth logic configured to interpolate the first and second estimates to produce interpolated digital samples having a second local sample rate that is synchronized with the network clock, the fourth logic configured to interpolate comprising: fifth logic configured to use a linear interpolator to produce the interpolated digital samples, sixth logic configured to equalize the interpolated digital samples to produce equalized digital samples; and seventh logic configured to decode the equalized digital samples to generate detected symbols therefrom.

***Conclusion***

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pankaj Kumar whose telephone number is (571) 272-3011. The examiner can normally be reached on Mon, Tues, Thurs and Fri after 8AM to after 6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Pankaj Kumar
Patent Examiner
Art Unit 2631

PK